

CLAIMS

1. A method of forming nanobubbles comprising of: abruptly reducing in size microbubbles contained in a liquid having an electrical conductivity of 300 $\mu\text{S/cm}$ by applying physical irritation thereto.
2. The method of forming nanobubbles according to claim 1, wherein in the step of abruptly reducing microbubbles in size, when the diameter of the microbubble is reduced to 200 nm or less, the charge density on the surface of the microbubble increases and an electrostatic repulsive force is produced, whereby the size reduction of the microbubble stops.
3. The method of forming nanobubbles according to claim 1, wherein in the step of abruptly reducing microbubbles in size, due to ions adsorbed on the gas-liquid interface and an electrostatic attraction, both ions in the solution having opposite charges to each other and attracted to the vicinity of the interface are concentrated in a high concentration so as to serve as a shell surrounding the microbubble and inhibit dissolution of a gas within the microbubble into the solution, whereby the microbubble is stabilized.

4. The method of forming nanobubbles according to claim 1, wherein the ions adsorbed on the gas-liquid interface are hydrogen ions and hydroxide ions and electrolytic ions within the solution are used as the ions attracted to the vicinity of the interface, whereby the microbubble is stabilized.
5. The method of forming nanobubbles according to claim 1, wherein in the step of abruptly reducing microbubbles in size, the temperature within the microbubble sharply rises by adiabatic compression so that a physicochemical change in association with the ultrahigh temperature is applied around the microbubble, whereby the microbubble is stabilized.
6. The method of forming nanobubbles according to claim 1, wherein the physical irritation is to discharge static electricity through the microbubbles using a discharge device.
7. The method of forming nanobubbles according to claim 1, wherein the physical irritation is to apply ultrasonic irradiation to the microbubbles using an ultrasonic generator.
8. The method of forming nanobubbles according to claim 1,

wherein the physical irritation is to cause the solution to flow by driving a rotor mounted in a vessel containing therein the solution and use compression, expansion and vortex flow which are produced during the flow.

9. The method of forming nanobubbles according to claim 1, wherein in the case of having a circulating circuit in the vessel, the physical irritation is to cause compression, expansion and vortex flow of the solution by passing the solution through an orifice or perforated plate having a single hole or a lot of holes after receiving the solution in which the microbubbles are suspended.